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Source:	Alex Nikolov, Vision Ng & Robin Renwick, Monero	
Title:	Digital Currency for Financial inclusion	
Contact:	Alex Nikolov Vision Ng United Kingdom	e-mail: alex@878ten.co.uk
Contact:	Robin Renwick Monero Ireland	e-mail: robin.renwick@trilateralresearch.com

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Abstract:	This document contains use scenarios of Digital Currency for Financial inclusion

Introduction:

The concept of financial inclusion is predicated on the hypothesis that certain barriers to entry for market participation exist. Individuals, traders or businesses are restricted from accessing a well-functioning economy. The barriers restrict participants from economic activity, which ultimately ensure participants cannot engage in value creation, value capture, transfer mechanisms, or involve themselves in a partly, or wholly, self-determined redistribution of wealth.

The DCGI group has intimated that the goal of financial inclusion is to ensure greater economic growth for society and a reduction of poverty. It is based on the presumption that access to financial services (and associated services like insurance, market analytics, etc) is the core driver for economic growth:

Utilizing digital advances to increase access to, and use of, formal access to financial services is a key component of The Bali Fintech Agenda, which outlines a number of high level goals.

It should be noted that access to financial services does not sit in isolation. There are 12 overall agenda items.

DCGI-I-051

“Financial inclusion is positioned prominently as an enabler of other developmental goals in the 2030 Sustainable Development Goals, where it is featured as a target in eight of the seventeen goals. These include SDG1, on eradicating poverty; SDG 2 on ending hunger, achieving food security and promoting sustainable agriculture; SDG 3 on profiting health and well-being; SDG 5 on achieving gender equality and economic empowerment of women; SDG 8 on promoting economic growth and jobs; SDG 9 on supporting industry, innovation, and infrastructure; and SDG 10 on reducing inequality. Additionally, in SDG 17 on strengthening the means of implementation there is an implicit role for greater financial inclusion through greater savings mobilization for investment and consumption that can spur growth.”¹

However, it is unclear whether measures should be solely economic², or whether socio-economic factors should be accounted for (trust, respect, privacy, ethics, etc). Prior research conducted by Samara and Pais³ (2011) finds correlation (for example) between the Human Development Index⁴ and the Index of Financial Inclusion.

There is also growing consensus forming around the hypothesis that formal finance is failing developing nations, as incumbent financial service providers are not able to explicitly increase economic participation as they do not provide the correct products to the market⁵.

In order to understand what is necessary to increase inclusion, it is worth looking at what exclusion means in this context.

Potential categories of exclusion:

- Unbanked
- Underbanked
- Un-utilised accounts

Unbanked

Unbanked is described by Investopedia as “A term used for adults who do not use banks or banking institutions in any capacity. Unbanked persons generally pay for things in cash or else purchase money orders. Unbanked persons also typically do not have insurance, pensions or any other type of professional money-related services”⁶. The World Bank have indicated there are 1.7 Billion Unbanked adults worldwide (2017)⁷. This figure does not include the amount of business that are operating without a bank account.

1 <https://www.uncdf.org/financial-inclusion-and-the-sdgs>

2 Philipsen, D. (2015). The little big number: how GDP came to rule the world and what to do about it. Princeton University Press.

3 Sarma, M., & Pais, J. (2011). Financial inclusion and development. Journal of international development, 23(5), 613-628.

4 <http://hdr.undp.org/en/content/human-development-index-hdi>

5 Helix Institute of Digital Finance, available at: <https://www.microsave.net/wp-content/uploads/2017/09/Finclusion-to-Fintech.pdf>

6 <https://www.investopedia.com/terms/u/unbanked.asp>

7 <https://globalindex.worldbank.org/>

Underbanked

Wikipedia describes the Underbanked as “The underbanked is a characteristic describing people or organizations who do not have sufficient access to mainstream financial services and products typically offered by retail banks and thus often deprived of banking services such as credit cards or loans.”⁸

Un-utilised accounts

User that have a registered bank account but are not using the service in the manner they would be normally expected to. This may be due to one specific issue, or a combination of factors (see causal factors, below).

Facts:

From total of 5.69 Billion adults, there are 1.7 Billion Unbanked worldwide⁹.

In some states, the ratio of adults with bank accounts is actually falling. Nigeria and Mexico are among the largest countries to see a significant fall in the number of people with bank accounts in recent years:

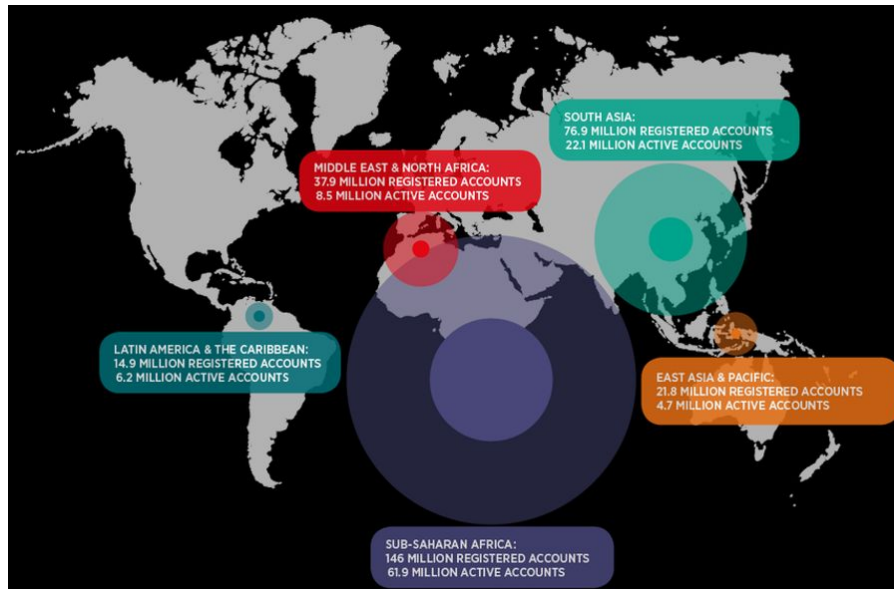
2014 (% with bank accounts)	2017 (% with bank accounts)	Country
70.3%	69.2	South Africa
50.5%	42.8	Algeria
50.2%	48.7	Argentina
44.4%	39.7	Nigeria
39.1%	36.9	Mexico
31%	30.8	Vietnam

On the whole bank accounts are getting more common globally, however in low- and middle-income countries, there is a rising problem of underutilised accounts. In these low and middle income countries, less than half of all people have an active account. Reports from the Center for Financial Inclusion¹⁰ shows that there are almost 370 million Indians with dormant bank accounts. 80% of Indians have an account, and this is up from 53% in 2014, but less than half of them are active. The dormant accounts have been reported to be a result of a mass marketing and financial inclusion drive by the government, which has initial uptake, but did not create medium and long term change in behaviour. The problem is also highlighted below:

8 <https://en.wikipedia.org/wiki/Underbanked>

9 <https://globalindex.worldbank.org/>

10 <https://www.centerforfinancialinclusion.org/>



Stateless and Refugees:

There is also data, from the UNHCR that shows:

“79.5 million people around the world have been forced to flee their homes. Among them are nearly 26 million refugees, around half of whom are under the age of 18.”¹¹

Coupled this to the “...millions of stateless people, who have been denied a nationality and lack access to basic rights such as education, health care, employment and freedom of movement.”¹²

Causal Factors:

1. Systemic (e.g. participation requires a formal identity, whilst no formal identity mechanism exists, or the individual cannot access it)
2. Technological (e.g. participation requires some identifiable device, but significant number of population do not have such device)
3. Operational (e.g. participant has device and identity, but is not literate enough to fairly participate)
4. Ethical (e.g. artificial restrictions are imposed, significant profit-driven costs deter participation, or participants are forced into an unethical and non-consensual trade-off for participation)
5. Empirical (e.g. what is the measure of successful inclusion, co-integration tests, causality tests, etc)

¹¹ <https://www.unhcr.org/en-ie/figures-at-a-glance.html>

¹² <https://www.unhcr.org/en-ie/ending-statelessness.html>

6. Instigatory (e.g. the “Chicken and the Egg” problem , where a lack of money in circulation leads to lack of market participation and activity)
7. Institutional (e.g. structural inequalities that nullify potential; lack of affective redistribution measures)

Structural Drivers of Inequality:

In the UK¹³, 54 million adult population as part of the developed world many of those engaging with banking and financial services are net losers.

- 1.71 Million adults do not have bank accounts
- 40% of the working age population have less than £100 savings
- The average UK household debt stands for more than £13000

Accumulating data demonstrates the inequality within the current money system.

For example, recent statistics:

- 26 million Brits use an overdraft every year with many of us using arranged and unarranged overdrafts each year
- 19 million Brits are using arranged overdrafts, 14 million Brits are using unarranged overdrafts and 7.3 million have both
- As many as 8.9 million Brits are potentially being charged overdraft fees which, they either don't know about or understand
- And from the same source: 40.93% of Brits don't have enough savings to live for a month without income.

In 2017, overdrafts were estimated to have created over **£2.4 billion in revenue for financial** institutions.

Cryptocurrencies:

Cryptocurrency networks might provide avenues for financial inclusion, emancipation, and technological utopianism¹⁴. More specifically, permissionless and decentralised value exchange networks seem to have explicitly inclusionary properties:

1. Decentralised money creation to stimulates economic activity
2. Decentralised and participatory governance
 - a. Civic responsibility enacted through network/node responsibility
3. Delivery vectors that utilise existing digital infrastructure
4. Global service delivery and offerings including coordination of decentralised organisations
5. Decentralised finance
 - a. p2p lending

¹³ Chris Lilly, Overdraft statistics <https://www.finder.com/uk/overdraft-statistics>

¹⁴ Scott, B. (2016). How can cryptocurrency and blockchain technology play a role in building social and solidarity finance? (No. 2016-1). UNRISD Working Paper. Available at: <https://www.econstor.eu/bitstream/10419/148750/1/861287290.pdf>

- b. Programmatically secure deposit certificates/interest
6. Access to investor instruments
 - a. Laissez-faire regulation/sandpits lowers barriers, but increases risks in the marketplace
 - b. Low systemic risk in case of project tokens
7. Censorship resistance and socio-political escapism
 - a. Value transfer mechanisms free from state surveillance/monitoring, particularly important for authoritarian regimes, regimes in political flux, etc
 - b. Afford off-economy activity for technological utopianism¹⁵
8. Cryptocurrency afford specific fundamental rights¹⁶
9. Network effects that stimulate efficiencies
 - a. ‘LocalGlobal’ - Local purpose provides initial incentive, which can then subsequently leverage cryptocurrency networks to provide global reach

Historical references for non-central bank currencies:

As in the Guernsey experiment in the period Napoleonic Wars (1803–1815)^{17 18} where project tokens can be issued to kick-start ventures, local currencies such as the Brixton Pound UK¹⁹ and BoaCompra Mexico²⁰ provide alternative “pixie dust” to energise economic activity.

Current Technical Landscape:

The Internet

- 50% or 3.6 billion people in the world do not have access to the Internet.²¹

Mobile Phone penetration²²

- 91% of adult population have access to mobile phone
- With 5.2 billion Unique Mobile Subscribers worldwide and a global population of about 7.7 billion,
- The global smartphone penetration has reached 41.5 percent or 2.16 billion.

15 Markey-Towler, B. (2018). Anarchy, Blockchain and Utopia: A theory of political-socioeconomic systems organised using Blockchain. Available at: <https://jbba.scholasticahq.com/article/3400.pdf>

16 Rueckert, C. (2019). Cryptocurrencies and fundamental rights. *Journal of Cybersecurity*, 5(1), tyz004. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2820634

17 Sardi, G., & Varga, J. (2017). LESSONS LEARNT FROM THE MONETARY SYSTEM OF GUERNSEY. *THE CENTRAL EUROPEAN JOURNAL OF REGIONAL DEVELOPMENT AND TOURISM*, 58.

18 Michael Journal, Guernsey's monetary experiment <https://www.michaeljournal.org/articles/monetaryreform/item/guernsey-s-monetary-experiment?/guernsey.htm>

19 <https://brixtonpound.org/>

20 <https://boacompra.com/>

21 ITU <https://news.itu.int/itu-statistics-leaving-no-one-offline/>

22 https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/03/GSMA_MobileEconomy2020_Global.pdf

Digital Identity

- Mobile service provider have substantial identity information
- Qualified Digital Signatures/Advanced Qualified Signatures
- Redefining notions of trust and identity
- Identifier controlled by the user plus selection of identity providers
- Different level of identification for different type of services
 - e.g. Potential use for Universal Personal Telephony (UPT) as a method for identification²³

The Gap

- 500,000,000 adults with no access to mobile devices
- 2 billion under the age of 15

How will they access services?

N.B: There is a need for non-digital offline solution

Case Studies (tbc):

Celo

<https://celo.org/>

cUSD (Celo Dollars) are a stable asset that follows the US Dollar. With cUSD, you can share money faster, cheaper, and more easily on your mobile phone.

Aragon

<https://aragon.org/>

“Aragon gives internet communities unprecedented power to organize around shared values and resources.”

Coins.ph

<https://coins.ph>

“Pay bills, buy load, buy digital currencies and send money – even without a bank account!”

The Philippines have gained the reputation as the Southeast Asian country with the largest number of overseas migrants. The Philippines is among the top five countries to receive remittances from overseas (US\$32.8 billion). Coins.ph converts remittances into cryptocurrencies such as Bitcoin or Ethereum prior to being sent to the receiver, who can then withdraw it as fiat currency. In this way, the need for intermediaries or third parties is removed. The remittance business in the Philippines,

23 https://en.wikipedia.org/wiki/Universal_Personal_Telecommunications

through blockchain-powered cryptocurrencies, has reduced the costs and decreased the settlement times of remittance transfers worldwide. This process, in addition to lowering transaction costs, allows customers on both ends to continue to leverage the institutions they are used to. In 2018, Coins.ph celebrated a major milestone of serving five million customers since it was founded in 2014.”²⁴

Monero

<https://getmonero.org>

Monero is cash for a connected world. It’s fast, private, and secure. With Monero, you are your own bank. You can spend safely, knowing that others cannot see your balances or track your activity. It allows users to operate in a privacy-preserving manner.

SALT Lending

<https://saltlending.com/>

Asset backed lending for the cryptocurrency market.

Simple Ledger Protocol (SLP) tokens

<https://simpleledger.cash/>

SLP minting application. The Bitcoin.com Mint is a non-custodial web wallet that allows users to store Bitcoin cash (BCH) and Simple Ledger Protocol (SLP) tokens. The Mint gives anyone the ability to create their own customized SLP tokens in less than a minute after they add a tiny fraction of BCH. The CEO of Bitcoin.com Stefan Rust gave a talk on how the cryptocurrency industry can create new markets with an assortment of tools. Rust noted that the Simple Ledger Protocol was growing. He mentioned how people were tipping each other with SLP-based spice, honks, and beers and how some of these tokens gained real market value and eventually were listed on prominent exchanges.

Trustlines foundation

<https://trustlines.foundation/>

“The Trustlines Foundation was established as a charitable organisation in 2018 in Liechtenstein. It pursues the charitable goal of promoting financial and economic inclusion of all people through decentralized peer-to-peer network protocols that serve common accounting.”

24 Deloitte, Can blockchains accelerate financial inclusion globally, available at: <https://www2.deloitte.com/lu/en/pages/technology/articles/blockchain-accelerate-financial-inclusion.html>

Conclusion:

We can agree with United Nations Secretary-General Special Advocate (UNSGSA) that “Financial inclusion cannot end poverty and inequality on its own, but it can contribute significantly to building better lives and more resilient communities. By opening a path to empowerment and opportunity for all, an inclusive financial system is essential infrastructure for every country.”

Potential Golden Bridge (note)

While there are many activities and business lines underpinned by usury, there is a deeper, fundamental reason for banks and financial services/advisors to exist. They are the trusted custodians, counterparties and advisers for those who wish to participate in financial markets and undertake transactions but who don't have the time, understanding or necessary infrastructure to do it for themselves.

The foundations of decentralised finance are emerging and there is an opportunity for banks and others to grow their customer base by actively assisting the growth of infrastructure for tokenisation. Ease of access to the means of engagement in economic activity through project and personal tokens will greatly expand the number of customers, transactions and fiduciary relationships.

Margins in percentages from likes of overdrafts will be much lower but volumes greatly increased. There are currently c. 1.7 billion people “unbanked” and a further 2 billion who aren't participating in rewarded economic activity.

The potential market for tokenisation is large, because the growing number of transactions between an expanding number of people, if not limitless, will eclipse the number of transactions processed by the current, centralised financial system.

Future Work:

We need to consider use case examples from a wider range, perhaps with a call from experts on some ideas and potential case studies. We also need to work on understanding what functional interoperability means, as opposed to just technical interoperability. There should be a number of networks competing to provide the financial services that are actually needed, in a free market system, instead of being dictated by the incumbent financial system.